

What is claimed is:

1. An electroluminescence element comprising:
an anode;
5 an electroluminescent film containing an organic compound capable of
generating electroluminescence, over the anode;
a floating electrode over the electroluminescent film;
an electron transport supporting layer over the floating electrode; and
a cathode over the electron transport supporting layer,
10 wherein at least one of the electroluminescent film and the electron transport
supporting layer contains a hole blocking material.
2. An electroluminescence element according to claim 1, wherein the cathode
comprises a conductive film formed by sputtering.
- 15 3. An electroluminescence element according to claim 1, wherein the cathode
comprises a translucent conductive film formed by sputtering.
4. An electroluminescence element according to claim 1, wherein the hole
20 blocking material has an ionization potential of 5.8 eV or more.
5. An electroluminescence element according to claim 1, wherein the hole
blocking material is an organic compound containing a phenanthroline skeleton or a
penta-coordinate type metal complex having an element belonging to Group 13 of the
25 periodic table as a central metal.
6. An electroluminescence element according to claim 1, wherein the cathode
comprises a conductive material having a work function of 3.5 eV or more.
- 30 7. An electroluminescence element according to claim 1, wherein the electron

transport supporting layer comprises an electron-transportable material having an electron mobility which is larger than a hole mobility.

8. An electroluminescence element according to claim 1, wherein the floating
5 electrode comprises a conductive material having a work function of 3.5 eV or less.

9. An electroluminescence element according to claim 1, wherein the floating
electrode comprises an insulating film formed contacted with the electroluminescence
film and a conductive film contacted with the electron transport supporting layer.

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10. An electroluminescence element according to claim 1, wherein the electron
transport supporting layer has a film thickness in the range of 10 nm to 1 μ m.

11. An electroluminescence element according to claim 1, wherein the
15 electroluminescence element is incorporated into a light emitting device.

12. An electroluminescence element according to claim 1, wherein the
electroluminescence element is incorporated into an electric appliance selected from the
group consisting of a personal computer, a video camera, a mobile computer, a player, a
20 digital camera, a cell phone, a portable book, and a display.

13. An electroluminescence element comprising:
an cathode;
an electroluminescent film containing an organic compound capable of
25 generating electroluminescence, over the cathode;
a floating electrode over the electroluminescent film;
an electron transport supporting layer over the floating electrode; and
a anode over the electron transport supporting layer,
wherein at least one of the electroluminescent film and the electron transport
30 supporting layer contains a hole blocking material.

14. An electroluminescence element according to claim 13, wherein the cathode comprises a conductive film formed by sputtering.

5 15. An electroluminescence element according to claim 13, wherein the cathode comprises a translucent conductive film formed by sputtering.

16. An electroluminescence element according to claim 13, wherein the hole blocking material has an ionization potential of 5.8 eV or more.

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17. An electroluminescence element according to claim 13, wherein the hole blocking material is an organic compound containing a phenanthroline skeleton or a penta-coordinate type metal complex having an element belonging to Group 13 of the periodic table as a central metal.

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18. An electroluminescence element according to claim 13, wherein the cathode comprises a conductive material having a work function of 3.5 eV or more.

19. An electroluminescence element according to claim 13, wherein the
20 electron transport supporting layer comprises an electron-transportable material having an electron mobility which is larger than a hole mobility.

20. An electroluminescence element according to claim 13, wherein the floating electrode comprises a conductive material having a work function of 3.5 eV or
25 less.

21. An electroluminescence element according to claim 13, wherein the floating electrode comprises an insulating film formed contacted with the electroluminescence film and a conductive film contacted with the electron transport
30 supporting layer.

22. An electroluminescence element according to claim 13, wherein the electron transport supporting layer has a film thickness in the range of 10 nm to 1 μm .

5 23. An electroluminescence element according to claim 13, wherein the electroluminescence element is incorporated into a light emitting device.

24. An electroluminescence element according to claim 13, wherein the electroluminescence element is incorporated into an electric appliance selected from the
10 group consisting of a personal computer, a video camera, a mobile computer, a player, a digital camera, a cell phone, a portable book, and a display.

25. An electroluminescence element comprising:
an cathode;
15 an electroluminescent film containing an organic compound capable of generating electroluminescence, over the cathode;
a floating electrode over the electroluminescent film;
an electron transport supporting layer over the floating electrode; and
a anode over the electron transport supporting layer,
20 wherein at least one of the electroluminescent film and the electron transport supporting layer contains a hole blocking material.

26. An electroluminescence element according to claim 25, wherein the cathode comprises a conductive film formed by sputtering.
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27. An electroluminescence element according to claim 25, wherein the cathode comprises a translucent conductive film formed by sputtering.

28. An electroluminescence element according to claim 25, wherein the hole
30 blocking material has an ionization potential of 5.8 eV or more.

29. An electroluminescence element according to claim 25, wherein the hole blocking material is an organic compound containing a phenanthroline skeleton or a penta-coordinate type metal complex having an element belonging to Group 13 of the periodic table as a central metal.

30. An electroluminescence element according to claim 25, wherein the cathode comprises a conductive material having a work function of 3.5 eV or more.

31. An electroluminescence element according to claim 25, wherein the electron transport supporting layer comprises an electron-transportable material having an electron mobility which is larger than a hole mobility.

32. An electroluminescence element according to claim 25, wherein the floating electrode comprises a conductive material having a work function of 3.5 eV or less.

33. An electroluminescence element according to claim 25, wherein the floating electrode comprises an insulating film formed contacted with the electroluminescence film and a conductive film contacted with the electron transport supporting layer.

34. An electroluminescence element according to claim 25, wherein the electron transport supporting layer has a film thickness in the range of 10 nm to 1 μm .

35. An electroluminescence element according to claim 25, wherein the electroluminescence element is incorporated into a light emitting device.

36. An electroluminescence element according to claim 25, wherein the electroluminescence element is incorporated into an electric appliance selected from the

group consisting of a personal computer, a video camera, a mobile computer, a player, a digital camera, a cell phone, a portable book, and a display.

37. An electroluminescence element comprising:
5 an anode;
an electroluminescent film containing an organic compound that generates electroluminescence, over the anode;
an electron transporting layer over the electroluminescent film;
a floating electrode over the electron transporting layer;
10 an electron transport supporting layer over the floating electrode;
a cathode over the electron transport supporting layer,
wherein at least one of the electroluminescent film and the electron transport supporting layer contains a hole blocking material.

15 38. An electroluminescence element according to claim 37, wherein the cathode comprises a conductive film formed by sputtering.

39. An electroluminescence element according to claim 37, wherein the cathode comprises a translucent conductive film formed by sputtering.

20 40. An electroluminescence element according to claim 37, wherein the hole blocking material has an ionization potential of 5.8 eV or more.

41. An electroluminescence element according to claim 37, wherein the hole
25 blocking material is an organic compound containing a phenanthroline skeleton or a penta-coordinate type metal complex having an element belonging to Group 13 of the periodic table as a central metal.

42. An electroluminescence element according to claim 37, wherein the
30 cathode comprises a conductive material having a work function of 3.5 eV or more.

43. An electroluminescence element according to claim 37, wherein the electron transport supporting layer comprises an electron-transportable material having an electron mobility which is larger than a hole mobility.

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44. An electroluminescence element according to claim 37, wherein the floating electrode comprises a conductive material having a work function of 3.5 eV or less.

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45. An electroluminescence element according to claim 37, wherein the floating electrode comprises an insulating film formed contacted with the electroluminescence film and a conductive film contacted with the electron transport supporting layer.

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46. An electroluminescence element according to claim 37, wherein the electron transport supporting layer has a film thickness in the range of 10 nm to 1 μ m.

47. An electroluminescence element according to claim 37, wherein the electroluminescence element is incorporated into a light emitting device.

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48. An electroluminescence element according to claim 37, wherein the electroluminescence element is incorporated into an electric appliance selected from the group consisting of a personal computer, a video camera, a mobile computer, a player, a digital camera, a cell phone, a portable book, and a display.

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49. An electroluminescence element comprising:

a cathode;

an electron transport supporting layer over the cathode;

a floating electrode over the electron transport supporting layer;

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an electron transporting layer over the floating electrode;

an electroluminescent film containing an organic compound that generates electroluminescence, over the electron transporting layer; and
an anode over the electroluminescent film.

5 50. An electroluminescence element according to claim 49, wherein the cathode comprises a conductive film formed by sputtering.

51. An electroluminescence element according to claim 49, wherein the cathode comprises a translucent conductive film formed by sputtering.

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52. An electroluminescence element according to claim 49, wherein the hole blocking material has an ionization potential of 5.8 eV or more.

53. An electroluminescence element according to claim 49, wherein the hole
15 blocking material is an organic compound containing a phenanthroline skeleton or a penta-coordinate type metal complex having an element belonging to Group 13 of the periodic table as a central metal.

54. An electroluminescence element according to claim 49, wherein the
20 cathode comprises a conductive material having a work function of 3.5 eV or more.

55. An electroluminescence element according to claim 49, wherein the electron transport supporting layer comprises an electron-transportable material having an electron mobility which is larger than a hole mobility.

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56. An electroluminescence element according to claim 49, wherein the floating electrode comprises a conductive material having a work function of 3.5 eV or less.

30 57. An electroluminescence element according to claim 49, wherein the

floating electrode comprises an insulating film formed contacted with the electroluminescence film and a conductive film contacted with the electron transport supporting layer.

5 58. An electroluminescence element according to claim 49, wherein the electron transport supporting layer has a film thickness in the range of 10 nm to 1 μ m.

59. An electroluminescence element according to claim 49, wherein the electroluminescence element is incorporated into a light emitting device.

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60. An electroluminescence element according to claim 49, wherein the electroluminescence element is incorporated into an electric appliance selected from the group consisting of a personal computer, a video camera, a mobile computer, a player, a digital camera, a cell phone, a portable book, and a display.

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61. An electroluminescence element comprising:

a cathode;

an electron transport supporting layer over the cathode;

a floating electrode over the electron transport supporting layer;

20 an electron transporting layer over the floating electrode;

an electroluminescent film containing an organic compound that generates electroluminescence, over the electron transporting layer; and

an anode over the electroluminescent film,

25 wherein at least one of the electroluminescent film and the electron transport supporting layer contains a hole blocking material.

62. An electroluminescence element according to claim 61, wherein the cathode comprises a conductive film formed by sputtering.

30 63. An electroluminescence element according to claim 61, wherein the

cathode comprises a translucent conductive film formed by sputtering.

64. An electroluminescence element according to claim 61, wherein the hole blocking material has an ionization potential of 5.8 eV or more.

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65. An electroluminescence element according to claim 61, wherein the hole blocking material is an organic compound containing a phenanthroline skeleton or a penta-coordinate type metal complex having an element belonging to Group 13 of the periodic table as a central metal.

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66. An electroluminescence element according to claim 61, wherein the cathode comprises a conductive material having a work function of 3.5 eV or more.

67. An electroluminescence element according to claim 61, wherein the
15 electron transport supporting layer comprises an electron-transportable material having an electron mobility which is larger than a hole mobility.

68. An electroluminescence element according to claim 61, wherein the
floating electrode comprises a conductive material having a work function of 3.5 eV or
20 less.

69. An electroluminescence element according to claim 61, wherein the
floating electrode comprises an insulating film formed contacted with the
electroluminescence film and a conductive film contacted with the electron transport
25 supporting layer.

70. An electroluminescence element according to claim 61, wherein the
electron transport supporting layer has a film thickness in the range of 10 nm to 1 μm .

30 71. An electroluminescence element according to claim 61, wherein the

electroluminescence element is incorporated into a light emitting device.

72. An electroluminescence element according to claim 61, wherein the electroluminescence element is incorporated into an electric appliance selected from the
5 group consisting of a personal computer, a video camera, a mobile computer, a player, a digital camera, a cell phone, a portable book, and a display.